

REMARKS

Claims 2, 4, 5, 6, 7, 9, 15, 17, and 20 have been amended. Claims 1, 10-14, 16 and 19 have been cancelled. In addition, FIGS. 3 and 12 of the drawings have been amended to correct informalities. The reconsideration of the application is respectively requested.

The drawings are objected to because the reference to "12" in figure 12 allegedly should be "15" and in figure 3 "144" should be "140". These corrections have been made.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they allegedly fail to include reference numeral 100 shown in figure 12 but not mentioned in the description. Reference numeral "100" has been deleted from figure 12.

A proposed correction is submitted herewith for approval by the Examiner.

Claim 20 stands rejected under 33 U.S.C. 112, second paragraph, as being indefinite. The Examiner states that the phrase "said collection chamber" in line 9 lacks an antecedent basis. This has been corrected by deleting from the claim the first reference to the collection chamber.

Claims 2 and 3 stand rejected under 35 U.S.C. 102(a) as being anticipated by the German reference DE 10014289 (DE '829). DE '829 discloses a water trap filter unit for use with a breath monitoring apparatus. The water trap filter unit includes a filter chamber interposed between the sample inlet and the sample. The interior of the chamber is divided by a diaphragm into inlet and outlet portions. The diaphragm blocks the flow of fluid into the outlet portion, fluid separated from the sample flow flowing into a collection

chamber that is communicated directly with a negative pressure port.

Claims 2 and 3 are dependent upon claim 6. Claim 6 recites a liquid separator including an inlet compartment interposed between a sample inlet port and a sample outlet port and having a first liquid trap filter element contained and supported within the inlet compartment and an outlet compartment, separate from the inlet compartment, interposed between a collection chamber and a low pressure port and having a second liquid trap filter element contained and supported within the outlet compartment. DE '829 neither discloses nor suggests an outlet compartment including a liquid trap filter element interposed between the collection chamber and the negative pressure port. Thus, claim 6 clearly distinguishes over DE '829 and is believed to be patentable over DE '829. Claims 2 and 3, which are dependent upon claim 6, are believed to be patentable along with parent claim 6.

Claims 2-4, 6, 7, 17 and 20 stand rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,886,528 to Aaltonen et al. (Aaltonen '528). Aaltonen '528 discloses a water separator for a gas analyzer of a configuration that gas travels all the time in a water separator in a condition resembling as closely as possible a conventional tubing. One embodiment, illustrated in figures 1-4, employs concentric tubing, the inner tubing of which extends between a sample inlet and the inlet of a fluid collection chamber and is of a porous wall material to allow gas to pass therethrough to the outer tubing to be drawn to measuring sections. A portion of the sample flow is sucked by a pump into a collection chamber and through further porous tubing to be combined with the main flow. In the embodiment illustrated in figures 5-8, tubular flow channels are defined on mating surface of the elements and a single diaphragm is compressed between the two elements, defining tubular passages

on opposite sides of the diaphragm. The purpose of these constructions is to produce gas flow through tubular elements all the time through the separator, and accordingly, in one embodiment, the porous tube itself forms the inlet sample flow path or flow chamber. In the other embodiment, a single diaphragm is common to both sample inlet and outlet flow paths and is the only separation between the inlet flow path and the outlet flow path. Also, the filter element is located at the interface between the elements and presumably provides sealing between the two element portions that form the housing of the water separator.

In contrast, applicants' liquid separator includes separate inlet and outlet compartments, each including an individual filter element contained and supported within the compartment in the flow path through the compartment. The filter elements are recessed within separate portions of the housing and a cover encloses the filter elements within the two compartments. A portion of the cover is located intermediate the two compartments, providing sealing between the cover and the top in which the inlet and outlet compartments are defined.

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Claim 6 is directed to a liquid separator for a gas analyzer and distinguishes over Aaltonen '528 by reciting a liquid trap filter chamber including an inlet compartment having an upper outlet communicated with a sample outlet port and a lower outlet communicated with a liquid collection chamber, a liquid trap filter element contained and supported within the inlet compartment interposed between the sample inlet port and the sample outlet port for separating liquid from the gas sample. Claim 6 further recites an outlet compartment separate from the inlet compartment and having an inlet communicated with the collection chamber and an outlet communicated with the low pressure port, and a second liquid trap filter element contained and supported within the outlet

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compartment interposed between the inlet and the outlet of the outlet compartment.

Claim 17 recites a liquid separator having inlet and outlet compartments that contain respective first and second filter elements generally in the manner of claim 6, and further distinguishes over Aaltonen '528 by reciting the inlet compartment having an inlet forward wall portion and an inlet back wall portion, the inlet back wall portion defining the upper outlet, a first gas permeable, liquid impermeable filter element contained and supported within the inlet compartment located between the inlet forward wall portion and the inlet back wall portion and interposed between the sample inlet port and the upper outlet for separating liquid from the gas sample, and the outlet compartment having an outlet forward wall portion and an outlet back wall portion, the outlet back wall portion defining the upper outlet, and a second gas permeable, liquid impermeable filter element contained and supported within the outlet compartment located between the outlet forward wall portion and the outlet back wall portion and interposed between the inlet and the outlet of the outlet compartment.

Claim 20 is generally similar to claim 17 and further distinguishes over Aaltonen '528 by reciting the inlet compartment having an inlet back wall portion defining the upper outlet and a first gas permeable, liquid impermeable filter element contained and supported within the inlet compartment overlying the back wall and spaced forwardly from the inlet back wall portion, and an outlet compartment having an outlet back wall portion defining the outlet, and a second gas permeable, liquid impermeable filter element contained and supported within the outlet compartment overlying the back wall and spaced forwardly from the outlet back wall portion. Therefore, claims 6, 17 and 20 are believed to distinguish patentably over Aaltonen '528. Claims 2-4 and 7 are dependent

upon claim 6 and are believed to be patentable along with claim 6.

Claims 5, 8 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Aaltonen '528 in view of United States Patent No. 4,465,485 to Kashmer et al. (Kashmer '485). Claims 5 and 8 are dependent upon claim 6 and claim 18 is dependent upon claim 17. Claims 6 and 17 are believed to distinguish patentably over Kashmer '485 for all of the reasons given above. Kashmer '485, cited for disclosing a membrane bearing a PTFE laminated filter element, does not suggest modification of Aaltonen '528 that would anticipate claims 6 or 17. Therefore, it is submitted that claims 5, 8 and 18 are patentable along with respective parent claims 6 and 17.

Claims 9 and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Aaltonen '528 or DE '829 in view of United States Patent No. 4,924,860 to Larsen et al. (Larsen '860). Claims 9 and 15 are dependent upon respective claims 6 and 17. Claim 6 distinguishes over Aaltonen '528 and DE '829 and claim 17 distinguishes over Aaltonen '528 for the reasons given above.

Claim 17 distinguishes over DE '829 by reciting the liquid separator as comprising an inlet compartment with a first filter element contained and supported within the inlet compartment and an outlet compartment with a second filter element contained and supported within the outlet compartment. As stated above with reference to claim 6, DE '829 neither discloses nor suggests an outlet compartment including a liquid trap filter element interposed between the collection chamber and the negative pressure port. Thus, claim 17 clearly distinguishes over DE '829 and is believed to be patentable over DE '829.

Larsen '860, cited for disclosing a self-sealing filter, neither discloses nor suggests modification of either Aaltonen '528 or DE '829 as to providing separate inlet and outlet compartments each including a gas permeable, liquid impermeable filter, that would anticipate claims 6 or 17. Therefore, it is submitted that claims 9 and 15 are patentable along with respective parent claims 6 and 17.

In summary, claims 2-9, 15, 17, 18 and 20 are believed to distinguish patentably over the cited art for all of the reasons given. Therefore, favorable reconsideration and allowance of the application is respectfully requested. If the Examiner believes that prosecution of the application can be so expedited, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

BY Leonard J. Kalinowski
Leonard J. Kalinowski
Practitioner
Registration No. 24,207

Reinhart Boerner Van Deuren, s.c.
Attn: Linda Gabriel, Docket Clerk
1000 North Water Street, Suite 2100
Milwaukee, WI 53202
414-298-8359

CUSTOMER NO. 22922